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Complexity in Employment Life Courses in Europe in the 20th Century – Large Cross-national Differences but Little Change across Birth Cohorts

Zachary Van Winkle & Anette Eva Fasang

Abstract

Whether employment life courses have become more unstable and complex across the 20th century has been a prominent topic in academic and public debate. Yet, empirical evidence on longer-term employment trajectories and how they changed across cohorts beyond single country analyses is sparse. In this paper, we propose a new methodological approach that includes measures developed in sequence analysis to summarize complexity in employment trajectories in a cross-classified multilevel model by cohort and country. This allows us to quantify and describe change in the complexity of employment trajectories across cohorts relative to variation across 14 European countries. We use SHARELIFE data to analyze employment trajectories from ages 15 to 45 for men and women born between 1918 and 1963. For these birth cohorts, findings show that change across cohorts is negligibly small compared with a sizeable variation of complexity in employment trajectories across countries. Further, based on theoretical assumptions derived from the varieties of capitalism literature, we demonstrate that the cross-national variation in employment complexity can, in part, be accounted for by employment protection legislation and unemployment protection measured as wage replacement rates. We conclude that in accordance with other studies, our findings contradict the commonly held belief that employment trajectories have become much more unstable across the second half of the 20th century. More generally, the proposed methodological approach is promising to analyze complexity in life course trajectories also in other areas of application.

1. Introduction

A widely held conception of advanced societies is that employment life courses have become more complex, more unstable and less predictable (Sennet 2006; 1998; Beck 1992; 2008; Hollister 2011). However, recent studies for single countries suggest much more stability in employment careers over the past decades than is commonly assumed (see Hollister 2011 for an extensive review for the US). Most of these studies focus on specific career phases, such as either labor market entry, early to mid-careers, or late careers (Brzinsky-Fay 2007; Fasang 2012; Biemann, Fasang, and Grunow 2011; Virtanen et al. 2011; Mayer, Grunow, and Nitsche 2010). Further they are often limited to specific subgroups, for instance men or women within single country contexts (Aassve, Billari, and Piccarreta 2007; Simonson, Gordo, and Titova 2011). Studies that include a comparative perspective tend to either compare change over time across birth cohorts (Biemann, Fasang, and Grunow 2011; Simonson, Gordo, and Titova 2011; Manzoni, Härkönen, and Mayer 2014), or a set of countries within one given time window (Brzinsky-Fay 2007; Fasang 2012) but do not put both in perspective to one another.

In this paper, we use individual level SHARELIFE data (Börsch-Supan et al. 2013; Börsch-Supan et al. 2011; Schröder 2011) to analyze complexity in employment trajectories from ages 15 to 45 for men and women born between 1918 and 1963 in 14 European countries.[i] Grounded in theoretical assumption from the varieties of capitalism (VoC) literature (Hall and Soskice 2001, Amable 2003), we combine the individual level data with macro level information on employment protection legislation (Allard 2005) and unemployment wage replacement rates (OECD 1994; Martin 1996). The incorporation of these macro level factors allows us to account for change across birth cohorts and cross-national differences in complexity in employment trajectories.

We seek to contribute to the literature in three ways. First, beyond looking at isolated employment outcomes for specific subgroups, such as first labor market entrance for men, we offer a more comprehensive description of complexity in longitudinal employment trajectories for men and women from ages 15 to 45. We thereby add to an increasing number of studies that have examined employment careers as longitudinal trajectories, treating them as "process outcomes", rather than focusing on single employment transitions as "point in time outcomes" (Abbott 2005). Second, we propose a new methodological approach that combines measures from sequence analysis with multilevel modeling. This strategy enables us to put changing complexity in employment trajectories across birth cohorts in perspective to variation across countries as a benchmark for evaluating the magnitude of change across birth cohorts. Third, we add to a growing literature (e.g. Biemann, Fasang, and Grunow 2011; Hollister 2011; Mayer, Grunow, and Nitsche 2010) showing that, contrary to commonly held beliefs, employment careers have not become notably more complex and instable across birth cohorts in the 20th century. Our analyses underline much more sizeable cross-national difference in the degree of complexity in employment trajectories. Further, our findings are in line with the assumptions derived from the varieties of capitalism framework that employment protection legislations decrease employment complexity and unemployment protection policies increase employment complexity.

2. Background and theory

Conceptualizing complexity in employment trajectories

We conceptualize complexity in employment trajectories as mobility between jobs as well as moves in and out of employment with a focus on timing within individuals' careers. Careers are commonly defined in the literature as a sequence of jobs or a history of job-shifts (Spilerman 1977), and usually suggest progress or a coherent ordering of jobs (Wilensky 1960). With our terminology of employment trajectories we imply no upward directionality in individual careers (Rosenfeld 1992).

Studies on job mobility commonly conceptualize mobility as snapshots in careers, i.e. as the number of transitions between jobs or the rate of job shifts (Carroll and Mayer 1986; Felmlee 1982; Hachen 1988) defined as a function of the number of jobs or transitions and the duration until a job shift (see Hollister 2011 on a recent review of indicators used for the related concept of employment stability). Not least due to data restrictions these studies tend to focus on specific career phases. Despite the rich insights this literature has generated, Rosenfeld emphasized as early as 1992 that "there is a need to continue to examine complete work histories. A problem with much of the work on job shifts is that one loses sight of the complete career line." (Rosenfeld 1992, 57).

How to conceptualize variation in longitudinal life course trajectories has been much debated over the past decades (Rosenfeld 1992, Brückner & Mayer 2005). We therefore chose several indicators of increasing variability in employment trajectories. In addition to more standard count measures, such as the number of jobs held and the total number of transitions, we apply a complexity metric developed in sequence analysis. Complexity is a composite measure of the number of transitions between different jobs and non-employment states as well as the predictability in employment trajectories (Gabadinho and Studer 2010; Gabadinho et al. 2011). In addition to earlier measures of sequence complexity (Elzinga 2010; see also Biemann, Fasang, and Grunow 2011), the measure proposed by Gabadinho and coauthors is not only sensitive to the sequencing of events, but also to the absence of trajectory states, such as the absence of non-employment or a second employment relationship (details in methods section). This more comprehensive measure allows us to examine the entire working age population including individuals out of the labor force for extended periods of time. This is important when analyzing men and women's employment trajectories across countries and across birth cohorts because the proportion of the population employed varies across countries and cohorts.

Measures of sequence complexity resonate with the concept of life course differentiation, which refers to "the process where the number of distinct states or stages across the life time increases." (Brückner and Mayer 2005, p.33). Prime examples of an increasing differentiation of working lives is "a process where firm tenure with only one or very few employers has been gradually replaced with frequent shifts between firms" or "the splitting of a single training period into several ones" (Brückner and Mayer 2005, p.33).

Job mobility is a central component of complexity in employment trajectories, next to moves into different states of non-employment, including education or family care. Vacancy-driven models explain job mobility through vacancy chains that define the opportunity structure of an organization (White 1970). Organizational opportunity structures that regulate job mobility are embedded in and affected by socio-historic contexts. This is a basic principle of the life course paradigm: macro-structural conditions, global trends and external shocks (e.g. wars) shape life courses by setting incentives and constraints in which individuals navigate their lives. Moreover, numerous studies in life course sociology emphasize that social change is driven by the replacement of older birth cohorts by younger ones and as a result tends to be rather slow and gradual (e.g. Mayer 2005). In the following, we discuss theoretical considerations about the changing complexity of employment trajectories across cohorts, followed by arguments about cross-national variation in employment trajectories.

Complexity in employment trajectories across birth cohorts

The oldest cohorts included in our analysis entered the labor market during and right after WW II. Economic growth following in the two decades after WW II, especially in capitalist market economies in Europe, led to larger internal labor markets and a higher degree of labor market segmentation with better opportunities for stable, upward job mobility for a larger proportion of the workforce (Blossfeld 1989). Thus cohorts coming of working age after WW II worked to a lesser extent in open employment relationships, which decreased highly complex, mobile employment trajectories associated with secondary sectors of the economy. Further, increasingly established school systems and more generous welfare transfers and policies stabilized labor market entry, which reduced complexity at the beginning of employment trajectories compared to the birth cohorts who entered the labor market before and during WW II (Mayer and Müller 1986; Kohli 1985). Traditional gendered life course norms foresaw relatively stable employment trajectories for men, who were employed in internal labor markets, and non-employment trajectories for women, who exited the labor market following child birth.

In the literature several factors are discussed that could have fueled more complex employment trajectories beginning in the 1960's and 1970's (see Hollister, 2011 for a summary of trends affecting employment stability). Scholars tend to assume some cross-national variation in the intensity of this trend, but overall it is often understood as a fairly universal development across western societies. First, economic recessions and restructuring following the oil crises of the 1970s was accompanied by more open, precarious and unsecured employment (Kalleberg 2012). Manufacturing jobs were gradually replaced by service sector jobs following economic tertiarization, which tended to erode long-term commitments between employees and employers (Harrison and Bluestone 1982). Employment trajectories for typical outsiders on the labor market, i.e. younger workers, older workers, women and the lower skilled, were at especially high risk of frequent shifts between jobs and in and out of employment after the oil crises of the 1970s (Blossfeld et al. 2005).

Second, economic globalization, that created more competitive global markets was broadly perceived to de-stabilize employment careers at different stages of the life course since the 1970s (Blossfeld et al. 2005; Blossfeld, Buchholz, and Hofäcker 2006; Blossfeld 1986). Increased foreign competition put pressure on firms to cut costs and stay competitive in globalized markets. Human resources management began to develop new nonstandard employment arrangements, which in turn affected individuals' careers.

Third, technological change reduced demand for lower skilled labor in manufacturing sectors and mid-skilled routine labor (Manning 2004; Oesch and Rodríguez Menés 2010). Technological change is therefore associated with job losses and lower incentives from employers to engage in long-term employment commitments, thus potentially increasing employment complexity. Further, companies shifted their perspectives and strategies from long-term stability to short-term profit in lieu of the share-holder revolution in the 1980's (Berg and Kalleberg 2001). Again, human resources management developed new employment strategies that reduced costs through firm restructuring, lay-offs and nonstandard employment arrangements.

Finally, more complex employment trajectories may result from individuals seeking self-fulfillment, and pursuing new ways of balancing work and private lives (e.g. Arthur and Rousseau 1996). Whereas the factors above stem from employers and adversely affect lower-skilled workers, higher educated workers that experience a liberalizing education may adopt postmodern values that prioritize a fulfilling balance of work and private life with more flexible periods of work and non-work over the life course. Overall, across advanced societies the two decades following WW II are commonly perceived as a historically exceptional "Golden Age" of relative life course standardization, stability and predictability that was followed by more "turbulent times" with more "turbulent lives" including higher complexity in employment trajectories for the cohorts born after 1950 who entered the labor market starting from the mid-1960s and early 1970s (Brückner and Mayer 2005; Mayer 2001).

Complexity of employment trajectories across countries

Early cross-national comparisons of life course outcomes employed a dualistic model that contrasted liberal, open and deregulated societies to corporatist, closed and coordinated societies (Mayer 1997; Soskice 1991). The literature supports a tradeoff between labor market flexibility in liberal societies and labor market regulation in corporatist societies. For instance, Blau & Kahn (2002) demonstrate that while flexible institutions, e.g. in the United States, facilitate low unemployment during economic downturns at the cost of declining real wages, regulated labor markets, e.g. Germany, hold real wage levels stable at the cost of relatively high unemployment.

We rely on an extension of this dualistic model in comparative political economy– the varieties of capitalism (VoC) approach– to theorize how specific factors that vary between as well as within welfare state regimes over time are associated with the complexity of employment trajectories. The VoC approach links employment mobility to firms' strategic interactions with welfare state institutions and employees (Hall and Soskice 2001; Estevez-Abe, Iversen, and Soskice 2001). Figure 1 shows how employment complexity is linked to social policy within the VoC framework. Employment mobility is an outcome of what Estevez-Abe and colleges (2001) identify as welfare production regimes: a circular relationship between national social policies, individual skill development and the product market strategies of firms. Social policy incentivizes individuals to invest in certain skills sets. Firms rely on a labor pool with certain skill sets to produce products and therefore support social policies, which ensure that individuals continue to invest in skills they need to follow their specific product market strategy. Employment mobility then is the result of how social policies regulate firms' and individuals' options within and outside of the labor market.

Two crucial areas of social policy have been identified by Estevez-Abe and colleagues (2001) that regulate mobility within the VoC framework: employment protection legislation (EPL) and wage replacement rates (WRR). The empirical analyses presented below directly test the association between EPL and WRR with complexity in employment trajectories as central indicators of welfare production regimes thereby avoiding relatively crude regime typologies. Especially for women, parental leave policies and child care arrangements are additional crucial areas of social policies that incentivize the withdrawal or availability of mothers in the labor market.

Various studies have found that strong EPL is negatively associated with labor market mobility, i.e. low complexity in employment trajectories (e.g. Gangl 2003; DiPrete et al. 2001; DiPrete et al. 1997). EPLs restrict employer's rights to terminate employment contracts or to utilize short-term or other forms of nonstandard employment contracts. This strengthens the relative market power of employees and stabilizes existing employment relationships. Further, high levels of EPL limit employers' abilities to react competitively to market changes and increase the costs of hiring, therefore possibly increasing levels of stable non-employment.

The majority of studies on the level of wage replacement rates (WRRs) have concentrated on the relationship between WRRs and the duration of unemployment (see Tatsiramos and van Ours 2014 for a review). The empirical literature generally supports that higher WRRs are associated with lower rates of exiting unemployment, but higher exit rates shortly before benefit eligibility ends (Abbring, van den Berg, and van Ours 2005; Røed and Zhang 2003; Carling, Holmlund, and Vejsiu 2001). Higher WRRs decrease job search intensity, but also increase the degree of job selectivity among skilled workers with high reservation wages waiting for the best match. A limited number of studies have also established that higher WRRs increase the risk of job loss (Winter-Ebmer 2003; Anderson and Meyer 1997). High unemployment benefits induce an upward pressure on wages, making jobs unprofitable and increasing firms' desires for higher turnover rates. Employed individuals are also more likely to quit their jobs to find better paying employment when higher unemployment benefits can be claimed. Finally, high WRRs set incentives for non-employed individuals to engage in an active job search to find higher paying employment. In sum, high WRRs foster higher unemployment inflows and higher outflows, thereby generating more complex employment trajectories.

Figure 1: VOC Conceptual Framework Linking Employment Mobility and Welfare Production Regimes

Estevez-Abe and colleagues (2001) identify four ideal types of welfare production regimes that each impact employment mobility differently. Table 1 summarizes welfare production regimes, associated levels of EPL and WRR as well as our expectations for complexity in employment trajectories. We list one ideal typical country for each regime to illustrate the theoretical argument before specifying our hypotheses on the relationship between EPL and WRR with complexity in employment trajectories.

Table 1: Overview of Welfare Production Regimes and Expected Complexity in Employment Trajectories

The first welfare production regime corresponds closely with Hall and Soskice's (2001) liberal market economy (LME) (column 2, Table 1). The United Kingdom can be seen as the ideal type of an LME where firms follow a *Fordist mass production strategy* to produce large volumes of standardized goods. They do not require a highly skilled labor force, but rather rely on general skills to learn and perform routinized tasks and high turnover to keep labor costs low. As a result, there is little support for social protection schemes. Lacking any substantial employment protection legislation (EPL) combined with very low wage replacement rates (WRR), individuals will likely experience multiple employment transitions as well as transitions into and out of unemployment and show high complexity in employment trajectories. Note that we lack a clear prototype for the liberal regime in our data, since the United Kingdom did not participate in SHARELIFE and Irish data are not available.

The following three welfare production regimes (columns 3, 4, and 5 in Table 1) comprise distinct variants of coordinated market economies (CME) as originally outlined by

Hall and Soskice (2001). In the first type of CME, ideal-typically represented by Germany, firms follow a *diversified quality product market strategy,* specializing in the large-scale production of various high quality products. To retain their comparative advantage, these firms require employees with industry and firm specific skills able to continually improve the goods being produced. Extensive EPL incentivize the development of firm-specific skills by ensuring long-term employment relationships, while generous WRR enable mobility between firms within industries. Complexity in employment trajectories will therefore be moderate in CMEs following a diversified quality production strategy because high EPL hamper employment mobility whereas generous WRR foster mobility.

The second type of CMEs, ideal-typically represented by Italy, follow a *diversified mass production strategy* and specialize in the large scale production of various, standardized goods (column 4, Table 1). While these firms rely on firm-specific skills that enable employees to perform a wide range of tasks within the firm, they do not require industry-specific skills. Firm-specific skill development is incentivized with high EPL and low WRR. Individuals will likely be very immobile within in such contexts of strong employment protection legislation combined with low wage replacement rates with both few moves between jobs and little mobility into and out of employment. Further high EPL and low WRRs equally generate strong insider-outsider segmentation (e.g. Caroleo and Pastore 2001; Arellano 2005) that will maintain stable employment trajectories with low complexity for insiders and stable non-employment trajectories for outsiders.

In a third type of CME, represented by Denmark as an ideal-type, firms follow a high quality product niche strategy and produce custom-made, high quality products on a small scale (column 5, Table 1). Firms rely on highly skilled craft workers, and therefore on employees with industry specific skills. Unemployment protection including high WRRs is vital to incentivize industry-specific skill development and facilitate employee mobility between firms within the same industry. Individuals are likely to be highly mobile, therefore generating highly complex employment trajectories, because they are secure to leave employment relationships to seek better employment opportunities given high WRRs.

Finally, a fifth type of welfare production regime, ideal-typically represented by the Czech Republic (column 6, Table 1), is relevant for the post-communist countries in Eastern Europe. These countries have been classified as a new variety of capitalism with a comparative advantage in assembly and production for transnational enterprises: dependent market economies (Nölke and Vliegenthart 2009). Social protection polices resemble those of LMEs with both low EPL and WRR, which are likely to trigger high mobility and employment complexity. However, the life courses of our study cohorts were predominantly located in the communist period where employment within state controlled jobs was mandatory for men and women, thereby granting maximum employment protection. Because unemployment was virtually non-existent, wage replacement rates were of little relevance. As a result, employment trajectories during state communism were likely characterized by high stability and very low complexity, whereas younger birth cohorts whose employment trajectories were located in the post-transition period will be highly complex.

Comparative logic and summary of hypotheses

Figure 2 shows the employment trajectories from ages 15 to 45 of our study cohorts born 1918-1963 located in historical time. We group them into birth cohorts of 3 year intervals with slightly wider groups for the earliest and latest cohorts due to case number restrictions. The x-axis denotes historical time from 1918 until 2008. The diagonal lines show the birth cohorts from 1918-1923 until 1957-1963 as they move through historical time and grow older. The vertical lines signify WW II as well as the oil crises of the 1970s as exemplary period events demonstrating the age variation at which our study cohorts experienced them. Our oldest respondents had reached age 24 in 1939 when WW II broke out, whereas our youngest respondents were born in the early 1960s.

Figure 2: Lexis Diagram of Employment Trajectories from Ages 15 to 45 of the Study Cohorts (1918-1963) Placed in Historical Time (1933-2008)

Based on the considerations above, we formulate our core research question and hypotheses. Given that our study is the first to put change in employment trajectories into perspective with cross-national variation, we pose the descriptive research question: *Does complexity in employment trajectories vary more across countries or more across birth cohorts?*

Based on the theoretical considerations above, we hypothesize that *the complexity of employment trajectories has increased across birth cohorts (H1).* Building on the VoC framework, we hypothesize that *EPL is negatively associated with employment trajectory complexity (H2.1) and that WRRs are positively associated with employment trajectory complexity (H2.2).*

3. Data & Methods

We use data from the Survey of Health, Ageing and Retirement in Europe (SHARE), specifically the SHARE Job Episodes Panel (Brugiavini et al. 2013; Antonova et al. 2014) constructed from SHARELIFE. Our sample comprises 21,054 individuals, born between 1918 and 1963 in 14 European countries, with retrospectively collected annual information on educational and employment status from age 15 to 45.[ii] The SHARE Job Episodes Panel contains annual information on employment and family life domains for 26,768 individuals interviewed in SHARELIFE. The sample is reduced by less than one percent, due to the sample restriction to individuals born between 1918 and 1963 who we can observe until age 45, and by 20 percent, due to missing values on employment or educational information.[iii]

We conceptualize individual employment trajectories by combining the school-to-work transitions with moves between employers and transitions in and out of employment. Each individual sequence is composed of 30 consecutive years. States are defined either as 1) in education, 2) in full-time employment, 3) in part-time employment, 4) non-employed or 5) in retirement. Employment states are additionally differentiated by a job spell number, to allow for the observation of mobility between jobs, i.e. employers. We first define employment states by the job spell number and then as being full-time or part-time. For example, an employment sequence consisting of three states: i) a full-time job, ii) a part-time job and iii) a full-time job, is coded as a) 1st employment, full-time, b) 2nd employment, part-time, c) 3rd employment, full-time.[iv] It is not possible to identify internal and external employment mobility consistently, because of ambiguous question formulations and interviewer instructions in the work history module of SHARELIFE. We give priority to employment spells in the sequences if individuals are simultaneously working and in education, however this only affects 2.4% off all spells.

Part-time employment is defined subjectively by the respondents and not based on an objective number of working hours, which is not available in SHARELIFE. The subjective definition of part-time work has two advantages in the context of our study. First, it is less prone to recall error in the retrospective data compared to an exact count of working hours. Second, respondents' subjective classification of part-time employment likely reflects a shared understanding within their national context of what constitutes part-time employment. Objective definitions based on working hours would require different meaningful thresholds across countries, e.g. 20 or 30 hours, as the regulation and forms of part-time work vary considerably across countries (Kalleberg 2000). However, we do know whether employees switched from part-time to full-time or from full-time to part-time within the same employment spell, i.e. with the same employer, and include this information in the specification of the employment trajectories, e.g. 1st state "first employment, full-time" then

2nd state “first employment, part-time”. The state “non-employed” consists of individuals that are unemployed or had been observed to be employed or in education, but were neither working, unemployed, in education or retired. The latter consist mostly of women who are likely not actively participating in the labor market.

Our results are robust to different ways of handling missing employment state information. Generally, filling in gap states is more advisable than deleting sequences with missing state information, because the occurrence of missing states tends to be related to the type of sequence, e.g. sequences with many transitions tend to have more missing states because they are remembered less accurately (Halpin 2012; 2013). We therefore filled in missing states between the years 1939 and 1955 with a WW II gap state. We also included general gap states for persons with missing state information for a maximum of six years. The subsequent results are based on the separate WW II and missing information gap states. We achieve similar results using data consisting of full sequence information, completely deleting cases with missing information, and using full data without gap states completed with backwards and forwards filling methods.

Measuring complexity in employment trajectories

Our aim is to account for the variability within individual employment trajectories. We quantify variability within sequences using the complexity index developed by Gabadinho et al. (2010; 2011), which is defined as the geometric mean of the normalized number of sequence transitions and the normalized longitudinal sequence entropy. Entropy is maximal when the unpredictability about an outcome, e.g. the state element of a given sequence, is maximal. Formally, the complexity, C, of a sequence x is:

1 $$0 \leq C(x) = 100 * \sqrt{\frac{q(x)}{q_{max}} * \frac{h(x)}{h_{max}}} \leq 100,$$

where the number of transitions within a sequence, *q(x)*, and the longitudinal entropy of a sequence, *h(x)*, are divided by their respective maxima. Complexity is minimal in sequences composed of a single state and maximal in sequences that contain all state elements with equal durations and have a maximal number of transitions. The complexity index provides a more nuanced measure of employment trajectory differentiation than the number of job spells or job tenure, because the degree of unpredictability within careers is incorporated into the composite measure through sequence entropy.

Figure 3: Illustrative Employment Trajectories

As an example, consider the three hypothetical employment trajectories in Figure 3. The first sequence, which is composed of two education states (EDU), followed by two states within a first and then second job (JOB 1 and JOB 2) and finally four states within a third job (JOB 3), has a lower complexity value than both the second and third sequences that have an additional transition into unemployment (UE). The second and third sequences have the same number of transitions, but complexity is lower for the third sequence because of the high stability within the third job. Thus high stability within only one state during a relatively long time window will lead to lower sequence complexity values compared to sequences with continuous transitions where there is no period of stability in one state for longer durations of time.

We used several additional indicators to test the robustness of our main results, including the number of distinct states and the number of transitions in a given sequence, as well as the number of distinct full-time employment states and the number of all distinct employment states. While the results reported below do not lead to substantially different conclusions (see online supplement, section III.i, 10-15), these variables are technically count variables and thus require different analysis methods than our linear multilevel cross-classified model, such as Poisson regression. Additionally these sequence summary variables do not reflect the varying duration spent in distinct states, which is potentially important (Fasang 2012). We additionally analyze the complexity index weighted by the proportion of job transitions that are involuntary (see online supplement, section III.iii, 18-19). The results remain substantively the same, but have additional theoretical implications that are discussed below. We use the TraMineR package in R to calculate sequence complexity and visualize the employment trajectories (Gabadinho et al. 2011).

Cross-classified multilevel model by country and cohort

We use cross-classified multilevel random effects regressions to decompose the amount of employment career complexity that is attributable to countries and cohorts. These models represent a special case of multilevel modeling, in which the higher level units cannot be hierarchically ordered (Rabe-Hesketh and Skrondal 2012, 433f.; Snijders and Bosker 2012, 155f.). Applied cross-classified modeling is wide spread in educational research, where students are cross-nested in junior and secondary schools (Goldstein and Sammons 1997) or in schools and neighborhoods (Brannstrom 2008).

Our contribution is to combine cross-classified modeling with measures of sequence analysis to make it fruitful for core questions in labor market and life course sociology. In our model individuals are cross-classified by birth cohort membership and country residence. The cross-classified random effects approach allows us to simultaneously quantify the degree of individual employment trajectory complexity across countries and across birth cohorts. Formally, we model sequence complexity as:

2 $$y_{ijk} = \beta_0 + \zeta_j + \zeta_k + \varepsilon_{ijk},$$

where the sequence complexity y_{ijk} is composed of the constant β_0, i.e. the grand mean, and group specific and individual error terms.[v] The complexity variance attributable to countries and birth cohorts are identified through country and birth cohort specific deviations from the grand mean, ζ_j and ζ_k respectively. Note that change caused by "global" trends that affect all cohorts identically across all countries would be captured in the cohort specific deviations, whereas country specific differences across all cohorts would be captured by the country specific deviations. The relative proportion of complexity variance that is accountable to country or birth cohort specific differences, i.e. intraclass correlation coefficients (ICC) ρ, is calculated as:

2.1 $$Var(y_{ijk}) = Var(\zeta_j + \zeta_k + \varepsilon_{ijk}) = \psi_j + \psi_k + \sigma$$

2.2 $$\rho_{Country} = \frac{\psi_j}{\psi_j+\psi_k+\sigma} \quad | \quad \rho_{Cohort} = \frac{\psi_k}{\psi_j+\psi_k+\sigma}.$$

It is possible that change across birth cohorts is not universal across countries, but change across birth cohorts follows country specific patterns. This might be the case, because broad historical trends and "global" events are filtered through different national institutions that likely impact mobility in employment trajectories in country-specific ways (Mayer, 2004; Blossfeld et al. 2006). To test whether variation in the complexity of employment trajectories across birth cohorts is country specific we extend the additive cross-classified model above through an interacted random effect (see Shi, Leite, and Algina 2010 on the inclusion of interacted random effects in cross-classified models). If the estimated variance component of the interacted random effect is significantly higher than zero, then change in complexity over time is country specific and/or cohort differences are country specific. We find evidence for country specific change across birth cohorts, but the deviations are negligible. Further the results of interacted cross-classified models are not substantially different from the results attained by additive models (see online supplement, section II, 7-9). We therefore present results from more parsimonious, additive cross-classified models below.

Note that our methodological approach does not address the Age-Period-Cohort problem, but instead focuses on cohort effects. Because our outcome measure is a summary indicator of complexity in long-term employment trajectories of 30 years duration that covers multiple periods, we cannot clearly distinguish period effects. However the cohort effects that we estimate might include cohort-specific period influences that affected a given birth cohort particularly strongly. Age is factored out of our models, because the outcome variable in the multilevel models is a summary measure of employment complexity between ages 15 and 45.

We analyze and calculate the country and birth cohort intraclass correlation coefficients for the entire sample, as well as for men and women separately. To investigate the country and birth cohort complexity averages, we use empirical Bayes predictions of the random effects, ζ_j and ζ_k, and their standard errors (Rabe-Hesketh and Skrondal 2012, 109f.). Comparing empirical Bayes predictions of the country and cohort specific complexity intercepts improves on simply comparing means or OLS indicator estimates, because information is weighted by its reliability. The estimates of smaller countries and cohorts are corrected using information from the other clusters, and are thus closer to the sample grand mean. We also generated a balanced country and a balanced cohort panel and tested the robustness of our results. The results of these analyses are extremely similar and lead to the same conclusions (available from authors). We additionally estimate cross-classified multilevel models excluding single countries and cohorts to assess if any countries or cohorts influence the results particularly strongly (see online supplement, section IV.i and IV.ii, 20-21). The results reported below are overall highly robust to the exclusion of single countries and cohorts. Only the estimates of WRR on complexity are slightly sensitive to the exclusion of the 1918-1923 and 1924-1926 birth cohorts (details in online supplement, section IV.ii, 21).

Our models proceed in two steps. First, we calculate the degree of employment complexity that is attributable to countries and cohorts using the random-effects variance components of cross-classified regression models without covariates. Second, we account for employment complexity variation by adding covariates to the regression models, at the individual and country level. Our choice of covariates at the individual level is guided by factors that are commonly associated with career patterns: education according to a reduced ISCED 1997 scale, number of children, whether the respondent was ever married or not, whether the sector of first employment was public or private, the mode occupation using the ISCO 1988 schema as well as gender.

To measure our core macro variables, EPL and WRR, we use the historical EPL indicator developed by Allard (2005), which has information on our western European study countries from 1950-2003 and corresponds closely with the OECD's weighted 1998 EPL measure. For WRRs, we use the historic OECD summary measure of benefit entitlements available every two years from 1961 to 2005, which is the average of gross WRRs for two earnings levels, three family situations and three durations of unemployment (OECD 1994; Martin 1996). For each EPL and WRR, we generate variables that are constants within birth cohorts belonging to the same country. For each birth cohort, the country specific EPL and WRR data are averaged over years that correspond to the cohort's observed working life, i.e. from ages 15 to 45. For example, to generate the EPL value for the French 1954-1956 birth cohort, we average the French EPL values from 1970 to 2000, i.e. the range from 1955 plus 15 and 1955 plus 45.

Two issues needed to be addressed when generating the country-cohort EPL and WRR variables. First, there are no observable EPL and WRR data for Eastern European countries during state socialism, because neither EPL nor WRR have substantive meanings in economies with virtually no labor market or unemployment. The OECD first recorded EPL data for the Czech Republic and Poland in 1998 and WRRs in 2001. We use the averages of the Western countries for the years 1950-1989 for EPL and 1961 to 1989 for WRR for Poland, the Czech Republic and East Germany. Starting in 1990, we assign East Germany the EPL and WRR values from West Germany. For Poland and the Czech Republic we bridge the period from 1990 to 1997 for EPL and 2000 for WRR using the average between the sample mean before 1989 and the first observed values. Second, the EPL and WRR averages for the oldest birth cohort, 1918-1923, are based on only 15 years of observed EPL data (1950-1965) and 4 years of WRR data (1961-1965). The estimated EPL and WRR effects are overall highly robust to the omission of the Eastern European countries and the oldest birth cohorts (see online supplement, section IV.i and IV.ii, 20-21). Despite some imprecision in these indicators, we rely on the best data available to construct our EPL and WRR indicators for a wide range of birth cohorts and countries, which allows us to add to previous research on single countries or cohorts.

4. Results

Table 2 shows descriptive statistics for all variables included in the analysis separately for men and women. The largest country cluster is Belgium, composing 11 percent of the sample, whereas East Germany and Austria are the smallest countries in the sample with 2 and 3 percent, respectively. The birth cohort 1948-1950 comprises the largest cohort cluster with 12 percent, whereas the oldest and youngest birth cohorts, 1918-1923 and 1957-1963 are the smallest with 3 and 2 percent of the sample, respectively. The results of the analyses are not compromised by these small cohort sizes, since the results and conclusions presented are robust to their exclusion (see online supplement, section IV.ii, 21). Men and women have similar average complexity in employment trajectories, with a sample average of 16 complexity points on a scale of 0 to 100.

Table 2: Summary Statistics of Analytic Sample by Gender

Various cross-national differences can be seen in the relative frequency sequence index plots (Fasang and Liao 2014) in Figure 4 that display a set of representative employment sequences for each country.[vi] Employment trajectories within some countries, such as Switzerland, begin uniformly in education, whereas education in late adolescence is rare in others, such as Spain. A major difference lies in the number of jobs that individuals held. In countries such as Greece, most trajectories consist of a single employment relationship. In other countries such as Denmark, a majority of employment trajectories are characterized by four or more jobs. Another difference lies in the prevalence of part-time employment and non-employment. A large portion of employment trajectories in the Netherlands and Switzerland consist of stable non-employment, whereas non-employment in Denmark spans shorter periods and is often followed by part-time employment.

Figure 4: Relative Frequency Sequence Index Plots of Employment Trajectories by Country

Table 3 shows the results of the unconditional cross-classified random effects regression on individual employment trajectory complexity. Estimates from the additive model for the entire sample, model 1, are in the first column, whereas the results of the gender specific subsamples are displayed in the second column for men and the third for women, models 1.1 and 1.2 respectively.

Table 3: Unconditional Cross-Classified Random Effects Regression on Employment Complexity

Regarding our core research question, the models (Table 3) indicate that substantially more complexity variance is attributable to country level differences than differences in birth cohorts in all models. The unconditional average complexity is 16, as indicated by the constant in column one. The country specific variation from the average is 12.9, and thus much larger than the birth cohort specific variation from the average of 1.7. Whereas 15 percent of the individual complexity variance is attributable to country differences, only 2 percent of the employment complexity variance is accounted for by cohort differences, as indicated by the intraclass correlations in column one.

Figure 5: Mean Employment Complexity by Country & Cohort Calculated from Model 1 in Table 3

The Empirical Bayes predictions of the random intercepts calculated from model 2 are displayed in Figure 5 for countries and birth cohorts. Predictions from the gender specific models 2.1 and 2.2 are displayed in Figures A1-A4 (see online supplement). Overall they are similar for men and women, but country and cohort differences are slightly more pronounced for men. As can be seen in Figure 5, employment trajectories are least complex in Greece and Spain and the most complex in Sweden, Switzerland and Denmark, with average employment complexity in Belgium and West Germany. Denmark has significantly higher levels of employment complexity compared to West Germany, which has significantly higher levels compared to Italy and the Czech Republic. This is generally in line with our expectations derived from the VoC framework (see Table 1): diversified mass production regimes will have lower levels of complexity (Italy), followed by diversified quality production regimes (West Germany) with the highest levels of complexity in high quality niche production regimes (Denmark).

Compared to the country random intercepts, the cohort random intercepts displayed in Figure 5 vary much less, illustrating the higher degree of complexity variation between countries compared to cohorts. There is however a clear trend towards increasing complexity in employment trajectories across birth cohorts, which supports our first hypothesis. The employment trajectories of individuals have not followed a linear trend becoming increasingly complex, but rather the complexity increased for the cohorts born in the 1930’s and 1950’s while remaining rather stable for the cohorts born in the 1940’s . This could be due to the timing at which individuals experienced WW II and the 1970's oil crises. Cohorts born in the 1930's were more likely to suffer from a breakdown of institutions regulating the school-to-work transition during WW II, whereas cohorts born during the 1950's were likely to experience trouble entering the labor market in the 1970's during the oil crises and ensuing economic recession. A comparison of the gender specific estimates in Figures A2 and A4 (online supplement) further support this interpretation, because the difference of the cohort's estimate for men is somewhat more marked than that for women.

The results of the conditional cross-classified random effects regression on employment trajectory complexity are displayed in Table 4. In the first column we estimate the effects of individual characteristics on complexity. Country-cohort EPL and WRR variables are additionally controlled in model 2 and model 3, respectively to test hypotheses 2.1 and 2.2. Both EPL and WRR are held constant in model 4. In place of conditional intraclass correlation coefficients, we calculated the R-Squared value as suggested by Snijders & Bosker (2012). The R-Squared values can be interpreted as the percentage reduction in the total residual variance compared to the unconditional estimates from Table 3.

Table 4: Conditional Cross-Classified Random Effects Regression on Employment Complexity

Concerning the individual level control variables (column 1, Table 4), women have significantly more complex employment trajectories than men and individuals employed first in the public sector have less complex trajectories than those who begin a career in the private sector. Gender differences are small: only one-fifth the effect size of the sector of first employment. Higher levels of education are associated with more complex trajectories. As indicated by the R-squared value in column 1, these individual covariates reduce the total complexity variance by 8 percent.

As postulated in hypothesis 2.1, higher levels of EPL are significantly associated with lower levels of employment trajectory complexity, as seen in column 2 of Table 4. The total complexity variance is further reduced by 0.7 percentage points when EPL is controlled additional to individual characteristics. Higher levels of unemployment benefits are significantly and positively associated with employment trajectory complexity, which supports hypothesis 2.2. WRRs in addition to individual characteristics reduce the total complexity variance by 1 percentage point.

Both EPL and WRRs retain their significant association with employment complexity in a fully specified model, although their effect sizes diminish somewhat. Compared to the unconditional model, the total complexity variance is reduced by 10 percent by individual characteristics and country-cohort levels of EPL and WRRs. The country and cohort specific complexity variance is reduced by 40 and 30 percent, respectively.

Two aspects of the association between EPL and employment complexity merit further attention. 1) Our results using a sequence complexity index weighted by the proportion of involuntary job transitions indicates that EPL goes beyond stabilizing employment trajectories as a whole. EPL is particularly effective in lowering employment complexity by protecting individuals from the involuntary termination of employment relationships, such as layoffs (see online supplement, section III.iii, 18-19). 2) A stronger association between EPL and complexity for men (see online supplement, section I, 2-6) may indicate that other social policies play a more important role than EPL in the stabilization of women's employment trajectories. Women commonly exit the labor market following entry into parenthood and, in the absence of sufficient childcare arrangements, remain outside the labor market until children reach schooling age or leave the parental home. Further, a lack of paid maternal leave including a guarantee of returning to work with the same income could decrease women's willingness to invest firm specific skills (Estevez-Abe, Iversen, and Soskice 2001).

5. Discussion

Increasing complexity in employment trajectories over the second half of the 20th century is a common self-perception of developed societies (e.g. Hollister 2011). Yet recent studies on single countries raise doubt whether there is much variation in the complexity of employment careers over time, i.e. across birth cohorts at all (Biemann, Fasang, and Grunow 2011; Mayer, Grunow, and Nitsche 2010; Widmer and Ritschard 2009). Previous studies have either examined change across birth cohorts or differences across countries, rather than estimating variation on both dimensions simultaneously. To put change in the complexity of employment trajectories across birth cohorts in perspective, in this paper we propose a new methodological approach to simultaneously estimate the degree of life course variation over birth cohorts relative to the degree of life course variation across countries. Specifically, we include measures developed in sequence analysis to summarize employment complexity in a cross-classified multilevel model by cohort and country to analyze employment trajectories from ages 15 to 45 in 14 European countries between 1933 and 2008.

Given that our paper is the first to directly compare cross-cohort and cross-national variation, we posed the question whether the complexity of employment trajectories varies more across birth cohorts or across countries. Our results demonstrate that the complexity of employment trajectories varies to a much greater extent across countries compared to change over birth cohorts. Based on the comparative job mobility and life course literature we hypothesized that (1) the complexity of employment trajectories has increased across birth cohorts. Building on the varieties of capitalism (VoC) literature, we expected that levels of employment protection legislation (EPL) are negatively associated with employment trajectory complexity (H 2.1), while wage replacement rates during unemployment (WRR) are positively associated with complexity in employment trajectories (H 2.2). All of these hypotheses were supported by the results.

We contribute to the literature in three ways. First, beyond looking at specific employment career phases for specific subgroups, we address a lack of descriptive evidence with a more comprehensive analysis of complexity in employment trajectories in a larger cross-national comparison including a wider range of birth cohorts. Second, we propose a new methodological approach to quantify the degree of life course variation across birth cohorts versus the degree of variation across countries combining measures from sequence analysis with multilevel modeling. This allows us to conceptualize and measure complexity in employment trajectories as holistic "process outcomes" rather than more conventional point in time or count outcomes (Abbott 2005). Beyond this specific application, our methodological approach is promising for many areas of the social sciences concerned with how individual trajectories vary across social groups or geographic location and birth cohorts, such as organizational sociology or urban and regional studies. Third, we add to a growing literature showing that despite some variation across birth cohorts, employment careers have not become notably more complex and instable across the second half of the 20th century across many European societies. Instead, our analyses underline much more sizeable cross-national difference in the degree of complexity in employment careers. Our findings thereby contradict the commonly established belief that careers have become much more unstable, at least in the 14 European countries included in our analysis.

Further, we demonstrate that compositional differences in public employment and educational attainment as well as differences in EPL and WRRs account for some of the cross-national variance in the complexity of employment trajectories that we find. Specifically, EPL seem particularly effective in lowering involuntary employment mobility, whereas WRR increase voluntary mobility as additional analyses weighting the complexity index by the proportion of voluntary moves showed. In light of the discussion on labor market flexibility in Europe, the finding that strong EPL also protects workers from involuntary job termination is particularly important. Our study thereby highlights the broader implications of

EPL for career mobility in addition to the common focus on (un)employment spells in the literature (e.g. Gebel and Giesecke 2016; Di Tella and MacCulloch 2005). More generally, while labor market flexibilization in European countries decreases unemployment, it also comes with increased career complexity that makes individual life courses more unpredictable. Contextualized targeted small-N country comparisons might be promising to further disentangle causal linkages between broader welfare state institutions (e.g. Esping-Andersen 1990) and complexity in employment trajectories in specific countries (Mayer 2005).

Our findings have to be interpreted in the context of several limitations that should be addressed in future research. The SHARE data does not include the United States, United Kingdom or Ireland as a good representative of the liberal market economy with a Fordist mass production strategy. As we expect complexity to be highest within liberal countries, the share of variation attributable to the country level would likely be higher with their inclusion. The relatively short time-span in our analysis calls into question the appropriate historical time window to observe. If we had comparative data that included broader a span of birth cohorts, possibly we would find more pronounced change over cohorts born across the past two centuries. Further, it is possible that complexity in employment careers only increased for cohorts born after 1963, for which we cannot yet observe full employment trajectories until age 45. However, first results focusing on labor market entry for younger cohorts do not show evidence for an increase in complexity for selected countries (Biemann, Fasang, and Grunow 2011; Virtanen et al. 2011). Note that smaller differences between cohorts than countries could in part be due to the identification problem of age, period and cohort. If period effects vary greatly between countries and only slightly across birth cohorts, this would generate larger cross-national variation in employment complexity.

A final methodological limitation of this study lies in the small number of country and cohort clusters within our multilevel models. Recent simulation studies suggest that the estimated variance components presented here are biased downwards, thus leading to smaller intraclass correlation coefficients (see Bryan and Jenkins 2015 for more caveats common in cross-national multilevel modeling). These limitations likely render our study a conservative test when estimating the true levels of employment complexity attributable to countries and especially birth cohorts. The extensive robustness checks presented in the online appendix strengthen our confidence in our substantive findings despite the common problem of relatively small country sample size in cross-national research.

Overall, our findings underline previous research that contrary to common conjectures the complexity of employment careers has not increased substantially over the second half of the 20th century (Biemann, Fasang, and Grunow 2011; Mayer, Grunow, and Nitsche 2010; Hollister 2011). Instead our study supports the notion that "societies change very gradually and generally exhibit a high degree of persistence in basic institutions" (Mayer 2005, 17) as well as the employment trajectories that unfold within these country specific opportunity structures. Some scholars argue that instead there has been much more variation over historical time in family life courses in the 20th century (Brückner and Mayer 2005; Brüderl 2004; Elzinga and Liefbroer 2007; Fasang 2014). The combination of sequence analysis with multilevel modeling proposed in this study is promising to provide further insights on the relative change in life course complexity across time and countries also in other life domains, as well as other areas of application in the social sciences.

References

Aassve, Arnstein, Francesco C Billari, and Raffaella Piccarreta. 2007. "Strings of Adulthood: A Sequence Analysis of Young British Women's Work-Family Trajectories." *European Journal of Population Revue Européenne de Démographie* 23 (3–4). SPRINGER: 369–88. http://www.springerlink.com/index/10.1007/s10680-007-9134-6.

Abbott, Andrew. 2005. "The Idea of Outcome in U.S. Sociology." In *The Politics of Method in the Human Sciences*, edited by George Steinmetz, 393–426. Duke University Press.

Abbring, Jaap H, Gerard J van den Berg, and Jan C van Ours. 2005. "The Effect of Unemployment Insurance Sanctions on the Transition Rate from Unemployment to Employment*." *The Economic Journal* 115 (505). Blackwell Publishing Ltd: 602–30. doi:10.1111/j.1468-0297.2005.01011.x.

Allard, Gayle. 2005. "Measuring Job Security Over Time: In Search of a Historical Indicator for EPL (Employment Protection Legislation)." Business School Working Paper No. WP05-17. http://ssrn.com/abstract=1016327.

Anderson, Patricia M, and Bruce D Meyer. 1997. "Unemployment Insurance Takeup Rates and the After-Tax Value of Benefits." *The Quarterly Journal of Economics* 112 (3): 913–37. http://qje.oxfordjournals.org/content/112/3/913.abstract.

Antonova, Liudmila, Luis Aranda, Giacomo Pasini, and Elisabetta Trevisan. 2014. "Migration, Family History and Pension: The Second Release of the SHARE Job Episodes Panel." 18. SHARE Working Paper Series.

Arellano, F Alfonso. 2005. "Do Training Programmes Get the Unemployed Back to Work?: A Look at the Spanish Expierence." 05–25. Economic Series 15.

Arthur, Michael Bernard, and Denise M Rousseau. 1996. *The Boundaryless Career: A New Employment Principle for a New Organizational Era*. Oxford University Press.

Beck, Ulrich. 1992. *Risk Society: Towards a New Modernity.* London: Sage Publications.

———. 2008. *World at Risk*. Cambridge: Polity Press.

Berg, Ivar, and ArneL. Kalleberg. 2001. "Emerging Labor Market Structures." In *Sourcebook of Labor Markets SE - 1*, edited by Ivar Berg and ArneL. Kalleberg, 3–26. Plenum Studies in Work and Industry. Springer US. doi:10.1007/978-1-4615-1225-7_1.

Biemann, Torsten, Anette Eva Fasang, and Daniela Grunow. 2011. "Do Economic Globalization and Industry Growth Destabilize Careers? An Analysis of Career Complexity and Career Patterns Over Time." *Organization Studies* 32 (12): 1639–63. doi:10.1177/0170840611421246.

Blau, F D, and L M Kahn. 2002. *At Home and Abroad: U.S. Labor Market Performance in International Perspective*. New York, NY: Russell Sage Foundation.

Blossfeld, Hans-Peter. 1986. "Career Opportunities in the Federal Republic of Germany: A Dynamic Approach to the Study of Life-Course, Cohort, and Period Effects." *European Sociological Review* 2 (3): 208–25.

———. 1989. *Kohortendifferenzierung Und Karriereprozeß: Eine Längsschnittstudie Über Die Veränderung Der Bildungs- Und Berufschancen Im Lebensverlauf*. Frankfurt/Main: Campus Verlag.

Blossfeld, Hans-Peter, Sandra Buchholz, and Dirk Hofäcker, eds. 2006. *Globalization, Uncertainty and Late Careers in Society*. Taylor & Francis.

Blossfeld, Hans-Peter, Erik Klijzing, Melinda Mills, and Karin Kurz, eds. 2005. *Globalization, Uncertainty and Youth in Society*. London: Routledge.

Börsch-Supan, Axel, Martina Brandt, Karsten Hank, and Mathis Schröder. 2011. *The Individual and the Welfare State. Life Histories in Europe*. Spinger.

Börsch-Supan, Axel, Martina Brandt, Christian Hunkler, Thorsten Kneip, Julie Korbmacher, Frederic Malter, Barbara Schaan, Stephanie Stuck, and Sabrina Zuber. 2013. "Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE)." *International Journal of Epidemiology* 42 (4): 992–1001. doi:10.1093/ije/dyt088.

Brannstrom, L. 2008. "Making Their Mark: The Effects of Neighbourhood and Upper Secondary School on Educational Achievement." *European Sociological Review* 24 (4): 463–78. doi:10.1093/esr/jcn013.

Brückner, Hannah, and Karl Ulrich Mayer. 2005. "The De-Standardization of the Life Course: What It Might Mean and If It Means Anything Whether It Actually Took Place." In *The Structure of the Life Course. Standardized? Individualized? Differentiated?*, edited by Ross Macmillan, 27–54. Amsterdam: Elsevier.

Brüderl, Josef. 2004. "Die Pluralisierung Partnerschaftlicher Lebensformen in Westdeutschland Und Europa." *Aus Politik Und Zeitgeschichte* 19: 3–10.

Brugiavini, A, D Cavapozzi, G Pasini, and E Trevisan. 2013. "Working Life Histories from SHARELIFE: A Retrospective Panel." SHARE Working Paper Series 11-2013.

Bryan, Mark L, and Stephen P Jenkins. 2015. "Multilevel Modelling of Country Effects: A Cautionary Tale." *European Sociological Review* , May. http://esr.oxfordjournals.org/content/early/2015/05/08/esr.jcv059.abstract.

Brzinsky-Fay, Christian. 2007. "Lost in Transition? Labour Market Entry Sequences of School Leavers in Europe." *European Sociological Review* 23 (4): 409–22. doi:10.1093/esr/jcm011.

Carling, Kenneth, Bertil Holmlund, and Altin Vejsiu. 2001. "Do Benefit Cuts Boost Job Finding? Swedish Evidence from the 1990s." *The Economic Journal* 111 (474). Blackwell Publishers Ltd: 766–90. doi:10.1111/1468-0297.00659.

Caroleo, Ernesto, and Francesco Pastore. 2001. "How Fine Targeted Is ALMP to the Youth Long Term Unemployed in Italy ?" 62. CELPE Discussion Papers.

Carroll, GR, and KU Mayer. 1986. "Job-Shift Patterns in the Federal Republic of Germany: The Effects of Social Class, Industrial Sector, and Organizational Size." *American Sociological Review* 51 (3): 323–41. http://www.jstor.org/stable/2095305.

Di Tella, Rafael, and Robert MacCulloch. 2005. "The Consequences of Labor Market Flexibility: Panel Evidence Based on Survey Data." *European Economic Review* 49 (5): 1225–59. doi:10.1016/j.euroecorev.2003.11.002.

DiPrete, Thomas A, Dominique Goux, Eric Maurin, and Michael Tåhlin. 2001. "Institutional Determinants of Employment Chances: The Structure of Unemployment in France and Sweden." *European Sociological Review* 17 (3): 233–54. doi:10.1093/esr/17.3.233.

DiPrete, Thomas A, P Graaf, Ruud Luijkx, Michael Tahlin, and Hans-Peter Blossfeld. 1997. "Collectivist versus Individualist Mobility Regimes? Structural Change and Job Mobility in Four Countries." *American Journal of Sociology* 103 (2).

http://www.jstor.org/stable/10.1086/231210.

Elzinga, Cees H. 2010. “Complexity of Categorical Time Series.” *Sociological Methods & Research* 38 (3): 463–81. doi:10.1177/0049124109357535.

Elzinga, Cees H., and Aart C. Liefbroer. 2007. “De-Standardization of Family-Life Trajectories of Young Adults: A Cross-National Comparison Using Sequence Analysis.” *European Journal of Population / Revue Européenne de Démographie* 23 (3–4): 225–50. doi:10.1007/s10680-007-9133-7.

Esping-Andersen, Gøsta. 1990. *The Three Worlds of Welfare Capitalism*. Princeton, NJ: Princeton University Press.

Estevez-Abe, Margarita, Torben Iversen, and David Soskice. 2001. “Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State.” In *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, edited by Peter A Hall and David Soskice. Oxford: Oxford University Press.

Fasang, Anette Eva. 2012. “Retirement Patterns and Income Inequality.” *Social Forces* 90 (3): 685–711. doi:10.1093/sf/sor015.

———. 2014. ““New Perspectives on Family Formation: What Can We Learn from Sequence Analysis?” In *Advances in Sequence Analysis: Methods, Theories and Applications*, edited by Philippe Blanchard, Felix Bühlmann, and Jaques-Antoine Gauthier. Spinger.

Fasang, Anette Eva, and Tim F. Liao. 2014. “Visualizing Sequences in the Social Sciences: Relative Frequency Sequence Plots.” *Sociological Methods & Research* 43 (4): 643–76. doi:10.1177/0049124113506563.

Felmlee, Diane H. 1982. “Women’s Job Mobility Processes Within and Between Employers.” *American Sociological Review* 47 (1): 142–51.

Gabadinho, Alexis, Gilbert Ritschard, Nicolas S. Müller, and Matthias Studer. 2011. “Analyzing and Visualizing State Sequences in R with TraMineR.” *Journal of Statistical Software* 40 (4): 1–37.

Gabadinho, Alexis, and Matthias Studer. 2010. “Indice de Complexité Pour Le Tri et La Comparaison de Séquences Catégorielles.” *Revue Des Nouvelles Technologies de L’information RNTI E-19*, no. September 2015: 61–66.

Gangl, Markus. 2003. “The Only Way Is Up?: Employment Protection and Job Mobility among Recent Entrants to European Labour Markets.” *European Sociological Review* 19 (5): 429–49. doi:10.1093/esr/19.5.429.

Gebel, Michael, and Johannes Giesecke. 2016. “Does Deregulation Help? The Impact of Employment Protection Reforms on Youths’ Unemployment and Temporary Employment Risks in Europe.” *European Sociological Review* 32 (4): 486–500. doi:10.1093/esr/jcw022.

Goldstein, Harvey, and Pamela Sammons. 1997. “The Influence of Secondary and Junior Schools on Sixteen Year Examination Performance: A Cross-Classified Multilevel Analysis.” *School Effectiveness and School Improvement* 8 (2): 219–30. doi:10.1080/0924345970080203.

Hachen, DS. 1988. “Gender Differences in Job Mobility Rates in the United States.” *Social Science Research* 116: 93–116. http://www.sciencedirect.com/science/article/pii/0049089X88900014.

Hall, Peter A, and David Soskice. 2001. “An Introduction to Varieties of Capitalism.” In *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, edited by Peter A Hall and David Soskice. Oxford: Oxford University Press.

Halpin, Brendan. 2012. “Multiple Imputation for Life-Course Sequence Data.” WP2012-01. Department of Sociology Working Paper Series. https://ulir.ul.ie/bitstream/handle/10344/3639/Halpin_2013_multiple.pdf?sequence=2.

———. 2013. “Imputing Sequence Data: Extensions to Initial and Terminal Gaps, Stata’s Mi.” WP2013-01. Department of Sociology Working Paper Series. https://ulir.ul.ie/bitstream/handle/10344/3620/Halpin_2013_imputing.pdf?sequence=2.

Harrison, Bennett, and Barry Bluestone. 1982. “The Deindustrialization of America.” New York: Basic Books.

Hollister, Matissa. 2011. “Employment Stability in the U.S. Labor Market: Rhetoric versus Reality.” *Annual Review of Sociology* 37: 305–24. doi:10.1146/annurev-soc-081309-150042.

Kalleberg, Arne L. 2000. “Nonstandard Employment Relations: Part-Time, Temporary and Contract Work.” *Annual Review of Sociology* 26: 341–65.

———. 2012. “The Rise of Precarious Work.” *Pathways* Summer: 1–12.

Kohli, Martin. 1985. “Die Institutionalisierung Des Lebenslaufs. Historische Befunde Und Theoretische Argumente.” *Kölner Zeitschrift Für Soziologie Und Sozialpsychologie* 37 (1): 1–29.

Manning, Alan. 2004. “We Can Work It Out: The Impact of Technological Change on the Demand for Low-Skill Workers.” *Scottish Journal of Political Economy* 51 (5). Blackwell Publishing: 581–608. doi:10.1111/j.0036-9292.2004.00322.x.

Manzoni, Anna, Juho Härkönen, and Karl Ulrich Mayer. 2014. “Moving On? A Growth-Curve Analysis of Occupational Attainment and Career Progression Patterns in West Germany.” *Social Forces* 92 (4): 1285–1312. doi:10.1093/sf/sou002.

Martin, John P. 1996. “Measures of Replacement Rates for the Purpose of International Comparisons: A Note.” *OECD Economic Studies* 1 (26): 99–115. http://www1.oecd.org/social/labour/2502965.pdf.

Mayer, Karl Ulrich. 1997. “Notes on a Comparative Political Economy of Life Courses.” *Comparative Social Research* 16: 203–26.

———. 2001. *The Paradox of Global Social Change and National Path Dependencies: Life Course Patterns in Advanced Societies.* Routledge.

———. 2005. “Life Courses and Life Chances in a Comparative Perspective.” In *Analyzing Inequality: Life Chances and Social Mobility in Comparative Perspective*, edited by Stefan Svallfors, 17–55. Palo Alto, CA: Stanford University Press.

Mayer, Karl Ulrich, Daniela Grunow, and Natalie Nitsche. 2010. *Mythos Flexibilisierung? Wie Instabil Sind Berufsbiografien Wirklich Und Als Wie Instabil Werden Sie Wahrgenommen? Kolner Zeitschrift Fur Soziologie Und Sozialpsychologie*. Vol. 62. doi:10.1007/s11577-010-0106-1.

Mayer, Karl Ulrich, and Walter Müller. 1986. “The State and the Structure of the Life Course.” In *Human Development and the Life Course: Multidisciplinary Perspectives*, edited by Aage B Sorensen, F E Weinert, and L R Sherrod, 217–45. Hillsdale, NJ: Lawrence Erlbaum Associates.

Nölke, Andreas, and Arjan Vliegenthart. 2009. "Enlarging the Varieties of Capitalism: The Emergence of Dependent Market Economies in East Central Europe." *World Politics* 61 (4). Cambridge Journals Online: 670–702.

OECD. 1994. "THE OECD JOBS STUDY: Facts , Analysis , Strategies."

Oesch, Daniel, and Jorge Rodríguez Menés. 2010. "Upgrading or Polarization? Occupational Change in Britain, Germany, Spain and Switzerland, 1990–2008." *Socio-Economic Review* , December. http://ser.oxfordjournals.org/content/early/2010/12/15/ser.mwq029.abstract.

Rabe-Hesketh, Sophia, and Anders Skrondal. 2012. *Multilevel Modeling with Stata*. Revised. College Station, TX: Stata Press.

Røed, Knut, and Tao Zhang. 2003. "Does Unemployment Compensation Affect Unemployment Duration?*." *The Economic Journal* 113 (484). Blackwell Publishing: 190–206. doi:10.1111/1468-0297.00086.

Rosenfeld, R. 1992. "Job Mobility and Career Processes." *Annual Review of Sociology* 18 (1992): 39–61. doi:10.1146/annurev.soc.18.1.39.

Schröder, M. 2011. *Retrospective Data Collection in the Survey of Health, Ageing and Retirement in Europe. SHARELIFE Methodology*. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

Sennet, Richard. 2006. *The Culture of the New Capitalism*. New Haven: Yale University Press.

Sennett, Richard. 1998. *Corrosion of Character. The Personal Consequences of Work in the New Capitalism*. New York: W.W. Norton.

Shi, Yuying, Walter Leite, and James Algina. 2010. "The Impact of Omitting the Interaction between Crossed Factors in Cross-Classified Random Effects Modeling." *British Journal of Mathematical and Statistical Psychology* 63: 1–15.

Simonson, Julia, Laura Romeu Gordo, and Nadiya Titova. 2011. "Changing Employment Patterns of Women in Germany: How Do Baby Boomers Differ from Older Cohorts? A Comparison Using Sequence Analysis." *Advances in Life Course Research* 16 (2): 65–82. doi:10.1016/j.alcr.2011.03.002.

Snijders, Tom A. B., and Roel J Bosker. 2012. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. 2nded. Thousand Oaks, CA: Sage Publications.

Soskice, David. 1991. "The Institutional Infrastructure for International Competitiveness: A Comparative Analysis of the UK and Germany." In *The Economics of the New Europe*, edited by A. B. Atkinson and R. Brunetta, 45–66. London: Macmillan London.

Spilerman, Seymour. 1977. "Careers , Labor Market Structure , and Socioeconomic Achievement." *American Journal of Sociology* 83 (3): 551–93.

Tatsiramos, Konstantinos, and Jan C van Ours. 2014. "Labor Market Effects of Unemployment Insurance Design." *Journal of Economic Surveys* 28 (2): 284–311. doi:10.1111/joes.12005.

Virtanen, Pekka, Liudmila Lipiäinen, Anne Hammarström, Urban Janlert, Antti Saloniemi, and Tapio Nummi. 2011. "Tracks of Labour Market Attachment in Early Middle Age: A Trajectory Analysis over 12 Years." *Advances in Life Course Research* 16 (2): 55–64. doi:10.1016/j.alcr.2011.03.001.

White, Harrison. 1970. *Chains of Opportunity: System Models of Mobility in Organizations*. Harvard University Press.

Widmer, Eric D, and Gilbert Ritschard. 2009. "The de-Standardization of the Life Course: Are Men and Women Equal?" *Advances in Life Course Research* 14: 28–39. doi:10.1016/j.alcr.2009.04.001.

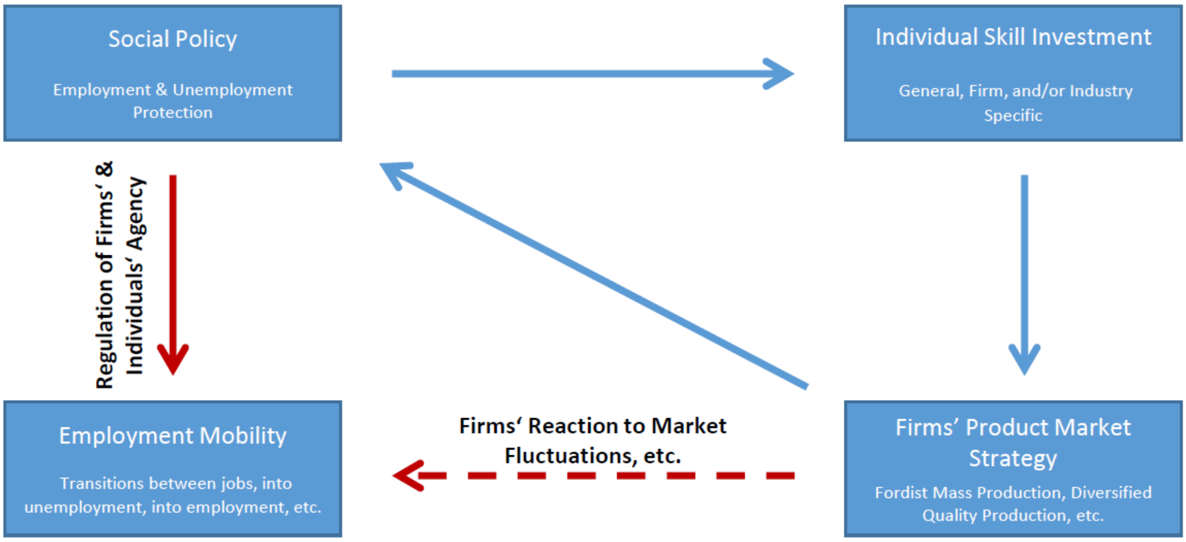
Wilensky, H. L. 1960. "Work, Careers, and Integration." *International Social Science Journal* 12: 543–60.

Winter-Ebmer, Rudolf. 2003. "Benefit Duration and Unemployment Entry: A Quasi-Experiment in Austria." *European Economic Review* 47 (2): 259–73. doi:http://dx.doi.org/10.1016/S0014-2921(01)00198-2.

Figures & Tables

Figures

Figure 1: VoC Conceptual Framework Linking Employment Mobility and Welfare Production Regimes



Note: Own graphical display; Based on Estevez-Abe, Iversen and Soskice (2001)

Figure 2: Lexis Diagram of Employment Trajectories from Ages 15 to 45 of the Study Cohorts (1918-1963) Placed in Historical Time (1933-2008)

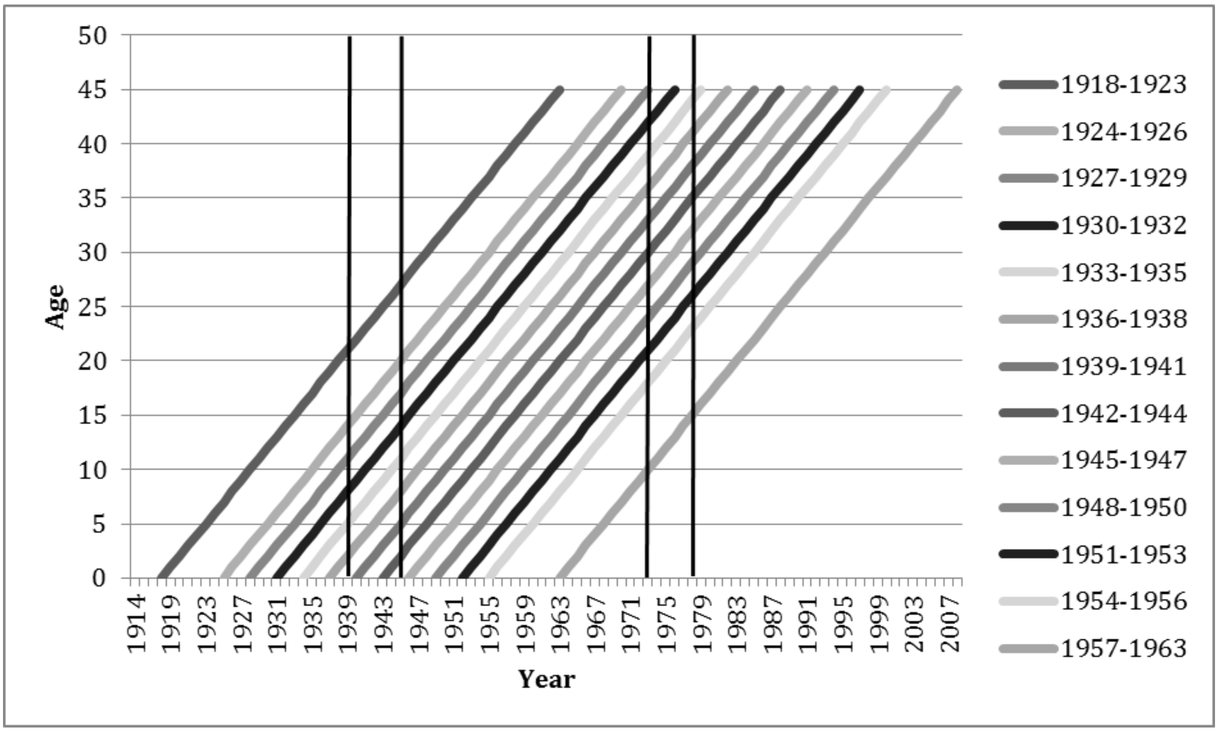


Figure 3: Illustrative Employment Trajectories

Employment Trajectory 1: $C(x) = 0.405$

EDU	EDU	JOB 1	JOB 1	JOB 2	JOB 2	JOB 3	JOB 3	JOB 3	JOB 3

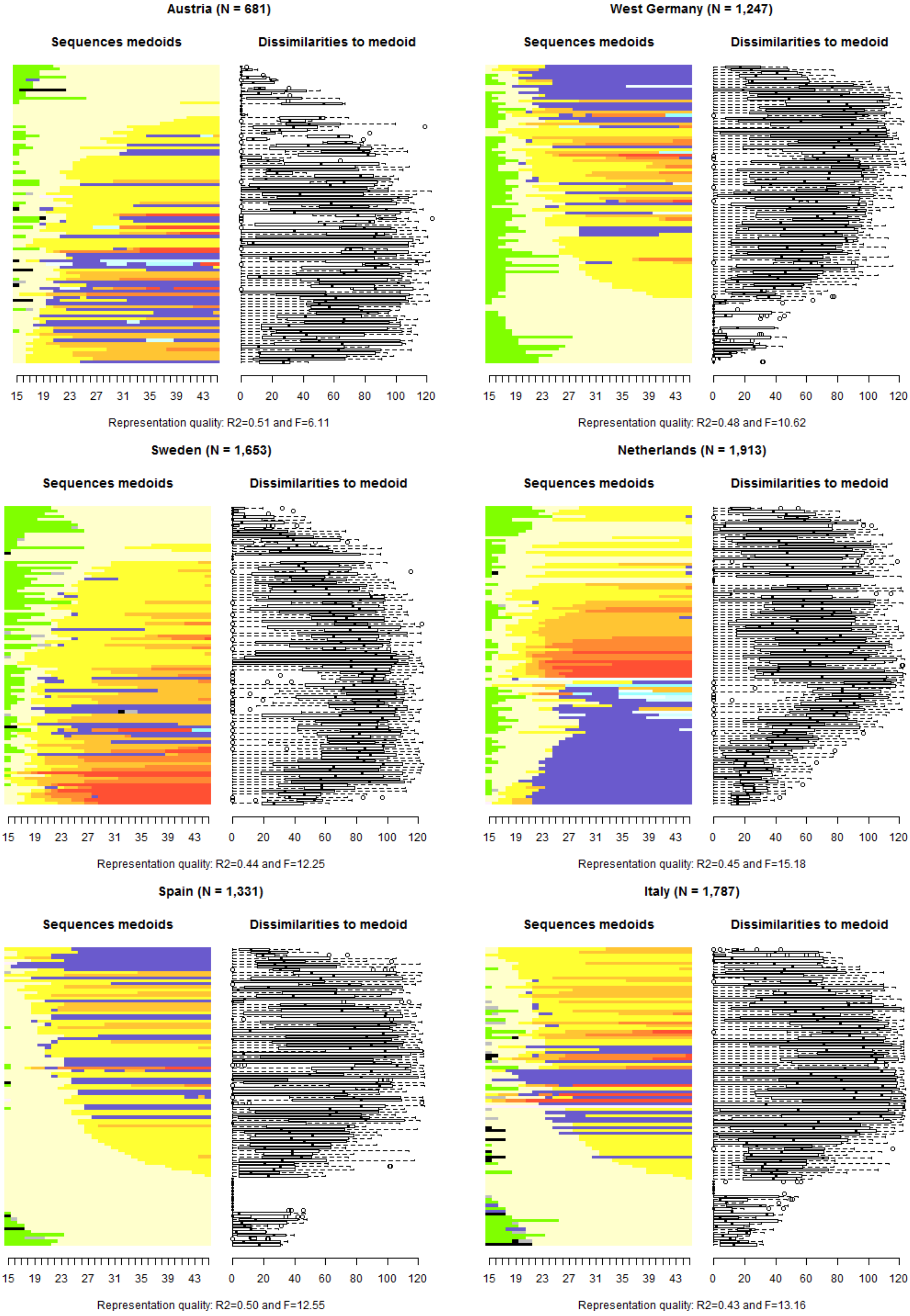
Employment Trajectory 2: $C(x) = 0.513$

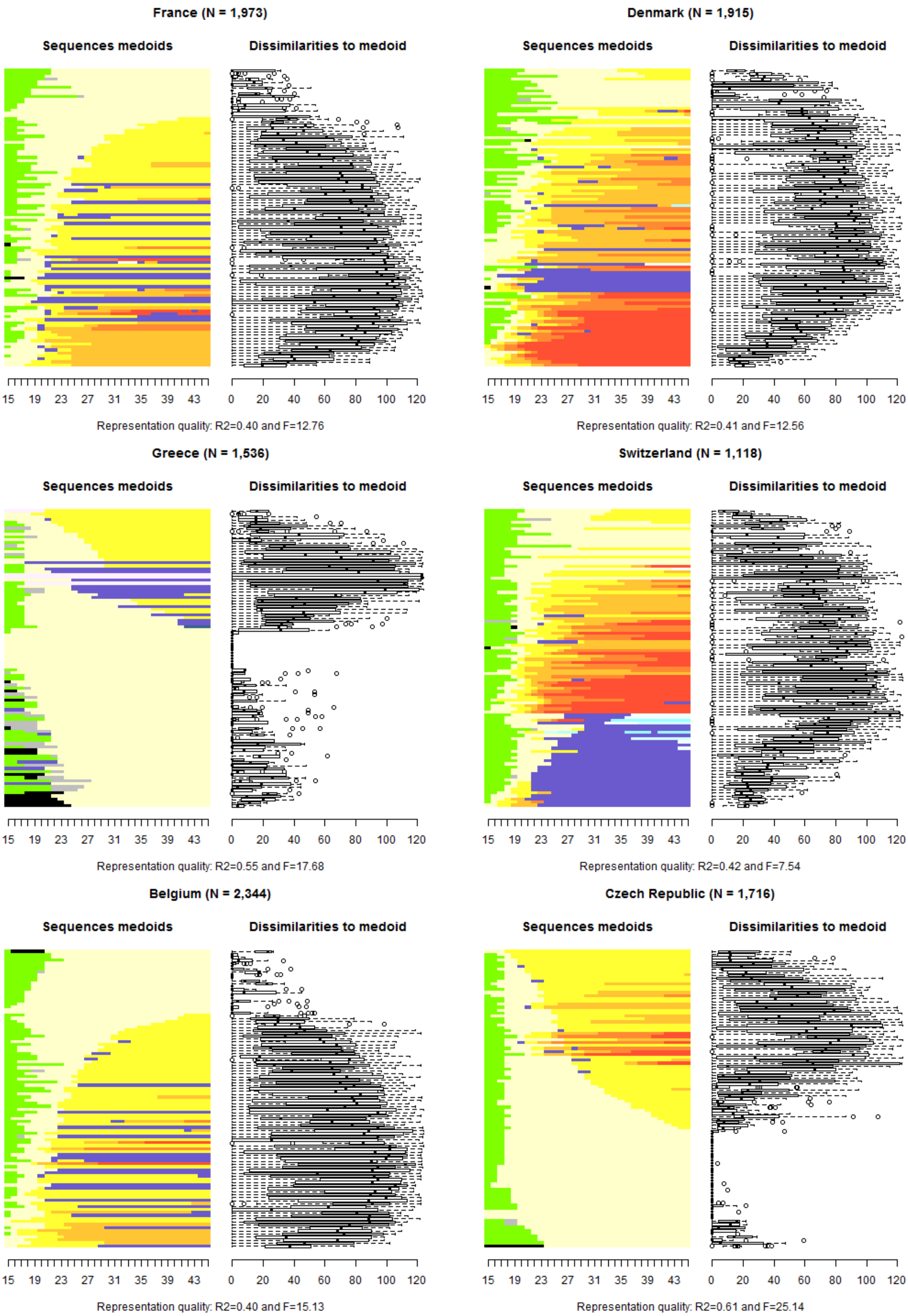
EDU	EDU	JOB 1	JOB 1	UE	UE	JOB 2	JOB 2	JOB 3	JOB 3

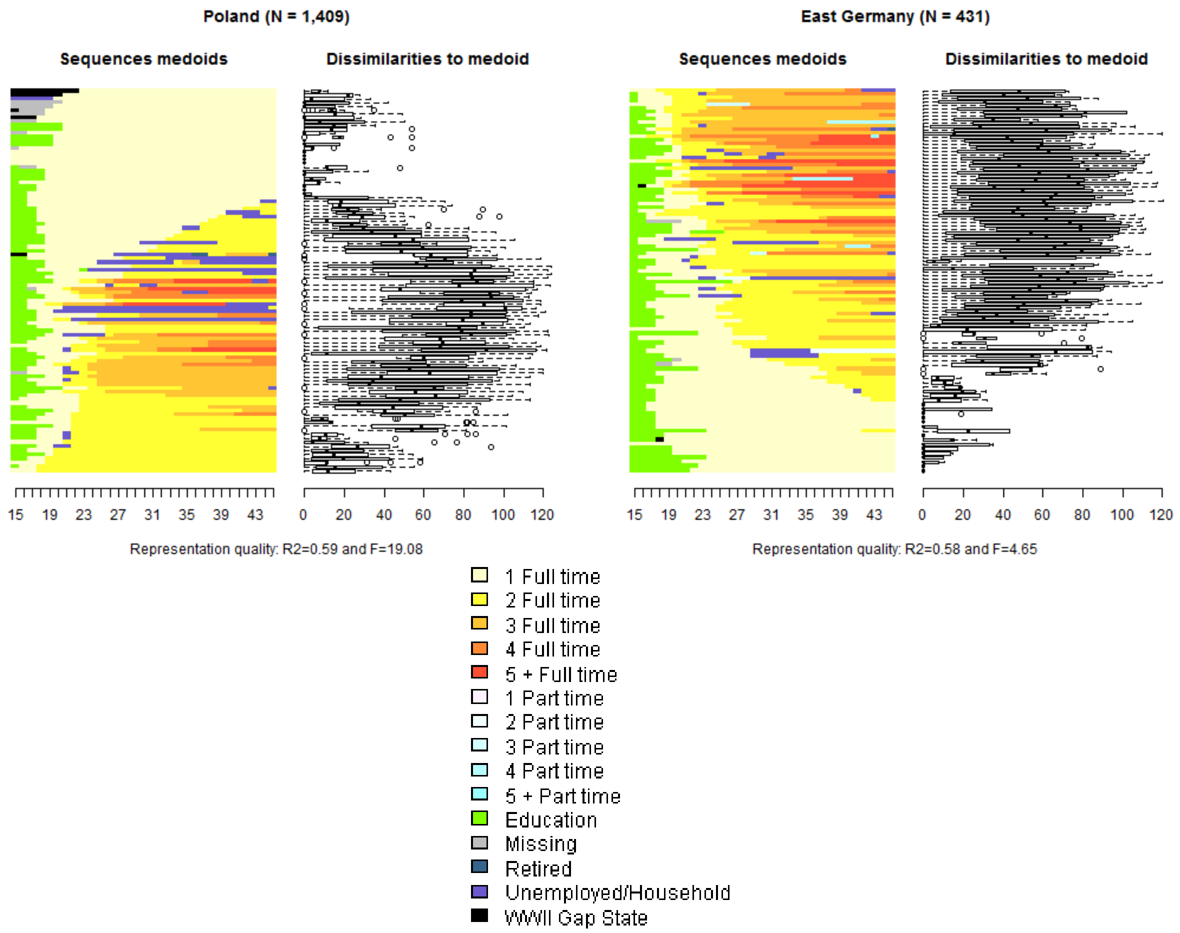
Employment Trajectory 3: $C(x) = 0.448$

EDU	JOB 1	UE	JOB 2	JOB 3	JOB 3	JOB 3	JOB 3	JOB 3	JOB 3

Figure 4: *Relative Frequency Sequence Index Plots of Employment Trajectories by Country*

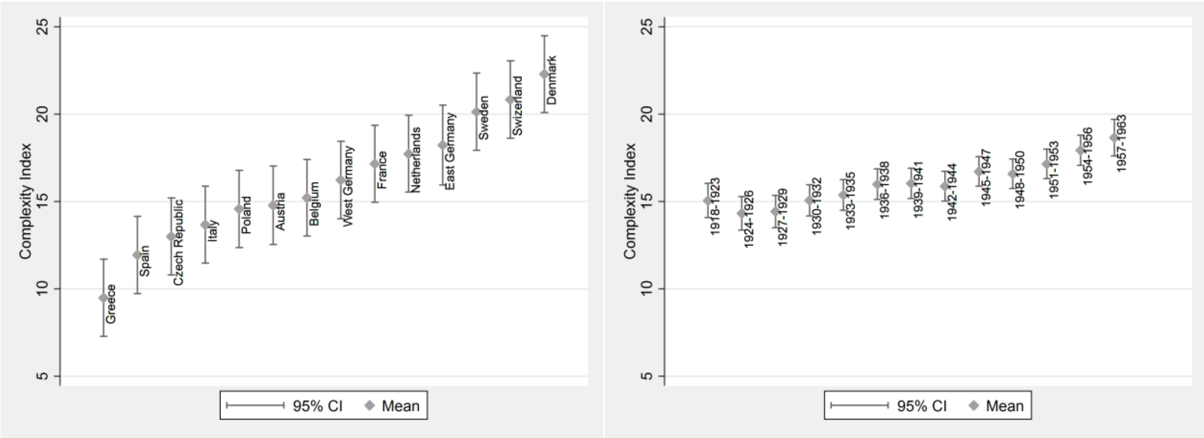



France (N = 1,973)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.40 and F=12.76
Denmark (N = 1,915)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.41 and F=12.56
Greece (N = 1,536)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.55 and F=17.68
Switzerland (N = 1,118)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.42 and F=7.54
Belgium (N = 2,344)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.40 and F=15.13
Czech Republic (N = 1,716)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.61 and F=25.14



Poland (N = 1,409)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.59 and F=19.08
East Germany (N = 431)
Sequences medoids
Dissimilarities to medoid
15 19 23 27 31 35 39 43
0 20 40 60 80 100 120
Representation quality: R2=0.58 and F=4.65
1 Full time
2 Full time
3 Full time
4 Full time
5 + Full time
1 Part time
2 Part time
3 Part time
4 Part time
5 + Part time
Education
Missing
Retired
Unemployed/Household
WWII Gap State

Figure 5: Mean Employment Complexity by Country and Cohort Calculated from Model 1 in Table 2



Tables

Table 1: Overview of Welfare Production Regimes and Expected Complexity in Employment Trajectories

Variety of Capitalism	Liberal Market Economy	Coordinated Market Economy			Dependent Market Economy
	1)	2)	3)	4)	5)
Product Market Strategy	Fordist Mass Production	Diversified Quality Production	High Quality Niche Production	Diversified Mass Production	Assembly Platform Production
Skills Demanded	General	Industry & Firm	Industry	Firm	General
Employment Protection (EPL)	Low	High	Low	High	Low
Unemployment Protection (WRR)	Low	High	High	Low	Low
Expected Mobility Levels	High	Moderate	High	Low	High
Ideal type	United Kingdom	West Germany	Denmark	Italy	Czech* Republic

*Only applies to these countries after communism, whereas during communism high EPL in the centrally planned economy will generate low employment complexity

Table 2: Summary Statistics of Analytic Sample by Gender

		Total	Men	Women
Country	Austria	3.23	2.87	3.59
	West Germany	5.92	5.87	5.97
	Sweden	7.85	7.38	8.31
	Netherlands	9.09	8.67	9.49
	Spain	6.32	7.21	5.47
	Italy	8.49	9.87	7.16
	France	9.37	8.89	9.83
	Denmark	9.10	8.36	9.81
	Greece	7.30	9.37	5.30
	Switzerland	5.31	4.86	5.75
	Belgium	11.13	11.25	11.03
	Czech Republic	8.15	7.00	9.26
	Poland	6.69	6.45	6.93
	East Germany	2.05	1.96	2.13
Cohort	1918-1923	3.16	3.05	3.26
	1924-1926	3.48	3.62	3.35
	1927-1929	4.58	4.72	4.44
	1930-1932	6.38	6.87	5.90
	1933-1935	7.31	8.13	6.51
	1936-1938	8.19	9.06	7.36
	1939-1941	9.25	9.65	8.87
	1942-1944	10.50	11.00	10.01
	1945-1947	11.49	11.46	11.53
	1948-1950	12.00	11.85	12.14
	1951-1953	11.66	11.45	11.86
	1954-1956	9.83	8.48	11.12
	1957-1963	2.18	0.65	3.64
Complexity*		16.25	15.52	16.96
		(9.22)	(9.17)	(9.22)
Number of Children*		2.08	2.08	2.08
		(1.32)	(1.33)	(1.31)
Sector 1st Employment	Private Sector	92.00	92.11	91.90
	Public Sector	8.00	7.89	8.10
Family Status	Never Married	6.12	6.16	6.09
	Married	93.88	93.84	93.91
Education	None	3.13	3.03	3.22
	Pre-Primary	23.16	22.78	23.53
	Primary	18.41	17.10	19.67
	Secondary	34.58	34.77	34.39
	Post-Secondary	20.72	22.31	19.19
N		21,054	10,315	10,739

Note: Percentages displayed; *Averages, standard deviations and value range displayed; Data not weighted

Table 3: Unconditional Cross-Classified Random Effects Regression on Employment Complexity

	Total (1)	Men (1.1)	Women (1.2)
Fixed Effects			
Constant	16.089***	15.657***	16.404***
	(1.035)	(0.995)	(1.084)
Random Effects			
Var(Country) – ψ_j	12.982***	12.414***	13.918***
	(5.112)	(4.910)	(5.500)
Var(Cohort) – ψ_k	1.796***	1.175***	2.219***
	(0.771)	(0.627)	(0.960)
Var(Interaction) – ψ_{jk}			
Var(Individual) – σ	71.645***	71.294***	70.979***
	(0.699)	(0.994)	(0.970)
Intraclass Correlations			
$\rho_{Country}$	15.02	14.62	15.97
ρ_{Cohort}	2.07	1.38	2.54
Log. R. Likelihood	-74902	-36689	-38177
N – Individuals	21054	10315	10739
N – Countries	14	14	14
N – Cohorts	13	13	13

Note: Significance Levels: ***p<0.001; Unstandardized regression coefficients displayed; Standard errors in parentheses; Significance of random effect parameters determined by likelihood-ratio tests. Data not weighted

Table 4: Conditional Cross-Classified Random Effects Regression on Employment Complexity

Fixed Effects	(1) Individual	(2) EPL	(3) WRR	(4) EPL & WRR
Gender	0.587***	0.585***	0.595***	0.591***
(Ref.: Female)	(0.127)	(0.127)	(0.127)	(0.127)
Number of Children	-0.029	-0.023	-0.028	-0.022
(Centered)	(0.046)	(0.046)	(0.046)	(0.046)
Sector 1st Employment	-2.782***	-2.782***	-2.775***	-2.776***
(Ref.: Private)	(0.232)	(0.232)	(0.232)	(0.232)
Family Status	0.459	0.443	0.469	0.453
(Ref.: Never Married)	(0.251)	(0.251)	(0.251)	(0.251)
Education				
(Ref.: Post-Secondary)				
None	-2.595***	-2.619***	-2.605***	-2.620***
	(0.385)	(0.385)	(0.385)	(0.385)
Pre-Primary	-2.362***	-2.370***	-2.354***	-2.359***
	(0.207)	(0.208)	(0.207)	(0.208)
Primary	-1.609***	-1.616***	-1.604***	-1.610***
	(0.206)	(0.205)	(0.206)	(0.206)
Secondary	-0.546**	-0.557**	-0.526**	-0.539**
	(0.173)	(0.173)	(0.173)	(0.173)
EPL		-0.954***		-0.916***
(centered)		(0.257)		(0.253)
WRR			0.049**	0.042*
(centered)			(0.017)	(0.018)
Constant	16.888***	16.817***	16.950***	16.873***
	(0.933)	(0.916)	(0.876)	(0.866)
Random Effects				
Var(Country) – ψ_j	10.060***	8.531***	8.943***	7.773***
	(3.966)	(3.385)	(3.541)	(3.094)
Var(Cohort) – ψ_k	0.703***	1.709***	0.413***	1.263***
	(0.325)	(0.820)	(0.229)	(0.666)
Var(Individual) – σ	68.722***	68.665***	68.728***	68.667***
	(0.671)	(0.670)	(0.671)	(0.670)
R^2 (%)				
Total	8.02	8.69	9.64	10.08
Log. R. Likelihood	-74456	-74450	-74443	-74441
N – Individuals	21054	21054	21054	21054

Note: Significance Levels: *p<0.05**p<0.01***p<0.001; Unstandardized regression coefficients displayed Standard errors in parentheses; Significance of random effect parameters determined by likelihood-ratio tests; Industrial branch of first employment also controlled; R-Squared values represent the percentage reduction of the random effects estimates against the unconditional estimates displayed in Table 3; All analyses estimated with 14 countries and 13 birth cohorts; Data not weighted

Notes

[i] This paper uses data from SHARE wave 4 release 1.1.1, as of March 28th 2013(DOI: 10.6103/SHARE.w4.111) and SHARE wave 1 and 2 release 2.6.0, as of November 29 2013 (DOI: 10.6103/SHARE.w1.260 and 10.6103/SHARE.w2.260). The SHARE data collection has been primarily funded by the European Commission through the 5th Framework Programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life), through the 6th Framework Programme (projects SHARE-I3, RII-CT-2006-062193, COMPARE, CIT5- CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812) and through the 7th Framework Programme (SHARE-PREP, N° 211909, SHARE-LEAP, N° 227822 and SHARE M4, N° 261982). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, R21 AG025169, Y1-AG-4553-01, IAG BSR06-11 and OGHA 04-064) and the German Ministry of Education and Research as well as from various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).

[ii] Our analyses are not weighted to correct for differential mortality, which is potentially important for our relatively old sample. In the conditional regression analysis we however control for the industrial branch of the first job, which is known to highly correlate with mortality. Nonetheless, our analyses only cover the population that survived at least until 2008.

[iii] We also analyzed a smaller sample of "life-time" employment trajectories from age 15-65. The results are substantially the same, but the range of birth cohorts, 1918-1944, is smaller.

[iv] An alternative would be to code this sequence as a) 1st full-time employment, b) 1st part-time employment and c) 2nd full-time employment. The complexity summary measurement is not affected by the coding of states, only by the number of different states and the results would thus remain the same.

[v] Because we have a relatively small number of higher level units, we use restricted maximum likelihood estimates (REML), treating the asymptotic estimates as approximates. We additionally estimate our models using identity covariance matrices.

[vi] Relative frequency sequence index plots are generated for each country by 1) sorting the sequences using the first factor derived from multidimensional scaling, 2) dividing the sorted sample into 100 subgroups, 3) choosing one mediod sequence from each subgroups as a representative sequence, 4) plotting the mediod sequences as a sequence index plot and 5) their dynamic Hamming distance to the other sequences within the subgroups as box-plots. R^2 and F statistics that evaluate the goodness of fit of the chosen mediod sequences are also included. The plots were created with the the seqplot.rf function developed by Matthias Studer, Anette Fasang and Tim Liao implemented in the TraMineRextras package using R.